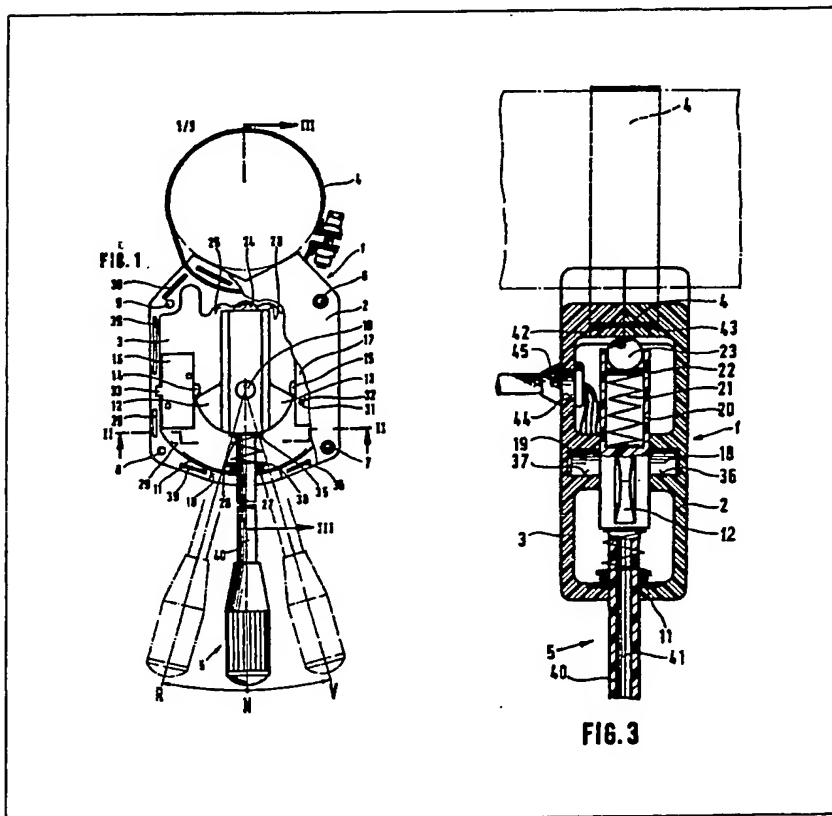


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GB 1329843
GB 1095239
GB 967204
GB 871933
GB 777024
GB 703018
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(54) Electrical switch for motor vehicles

(57) An electrical switch for an electro-hydraulically controlled gearbox comprises a switch actuating lever 5 which includes switching cams 12, 13 for the actuation of micro-switches 16, 17, axle portions 18, 19 for mounting the lever 5 in bores 36, 37 of two identical half shells 2, 3 forming the switch housing 1 and a guide 20 for receiving a spring biased indexing ball 23. The switch lever 5 and the half shells 2, 3 may be made of plastics material. The switch lever 5 may be reinforced by a wire 41. The half shells 2, 3 are each formed with projections 38 which engage recesses 39 on the other shell half. The switch may be a three position, as shown, or five position switch.



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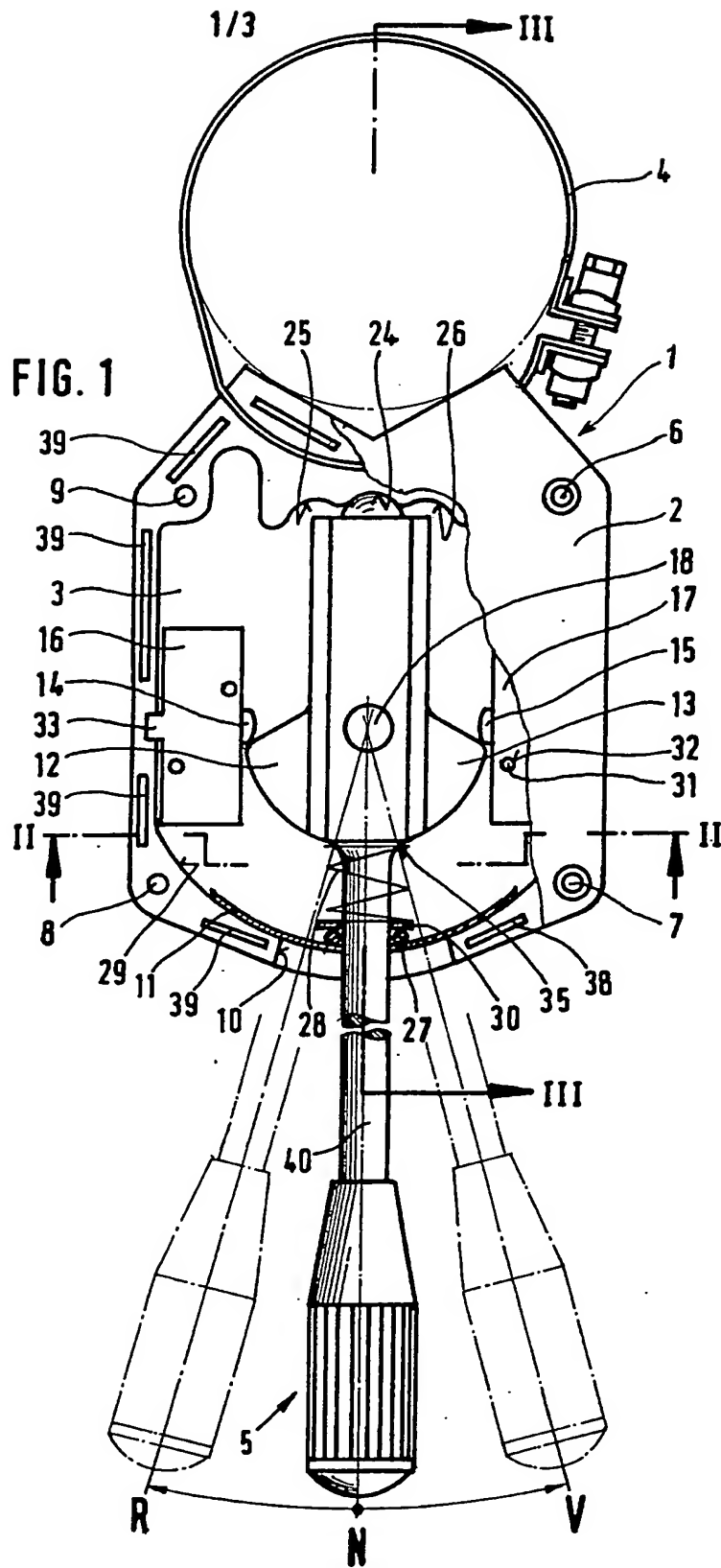


FIG. 5

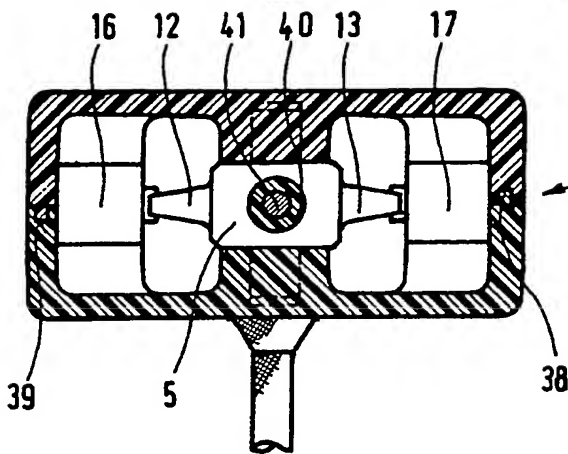
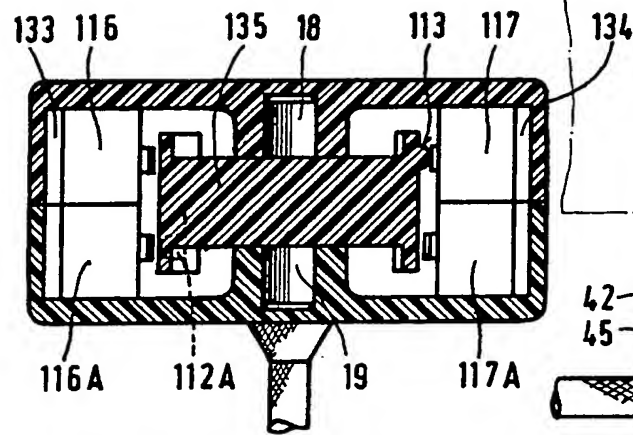


FIG. 2

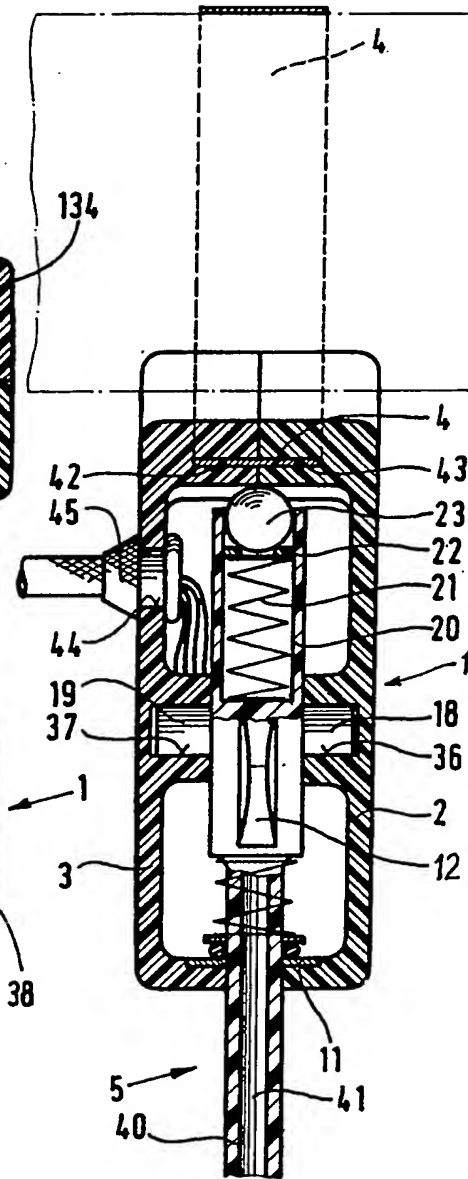
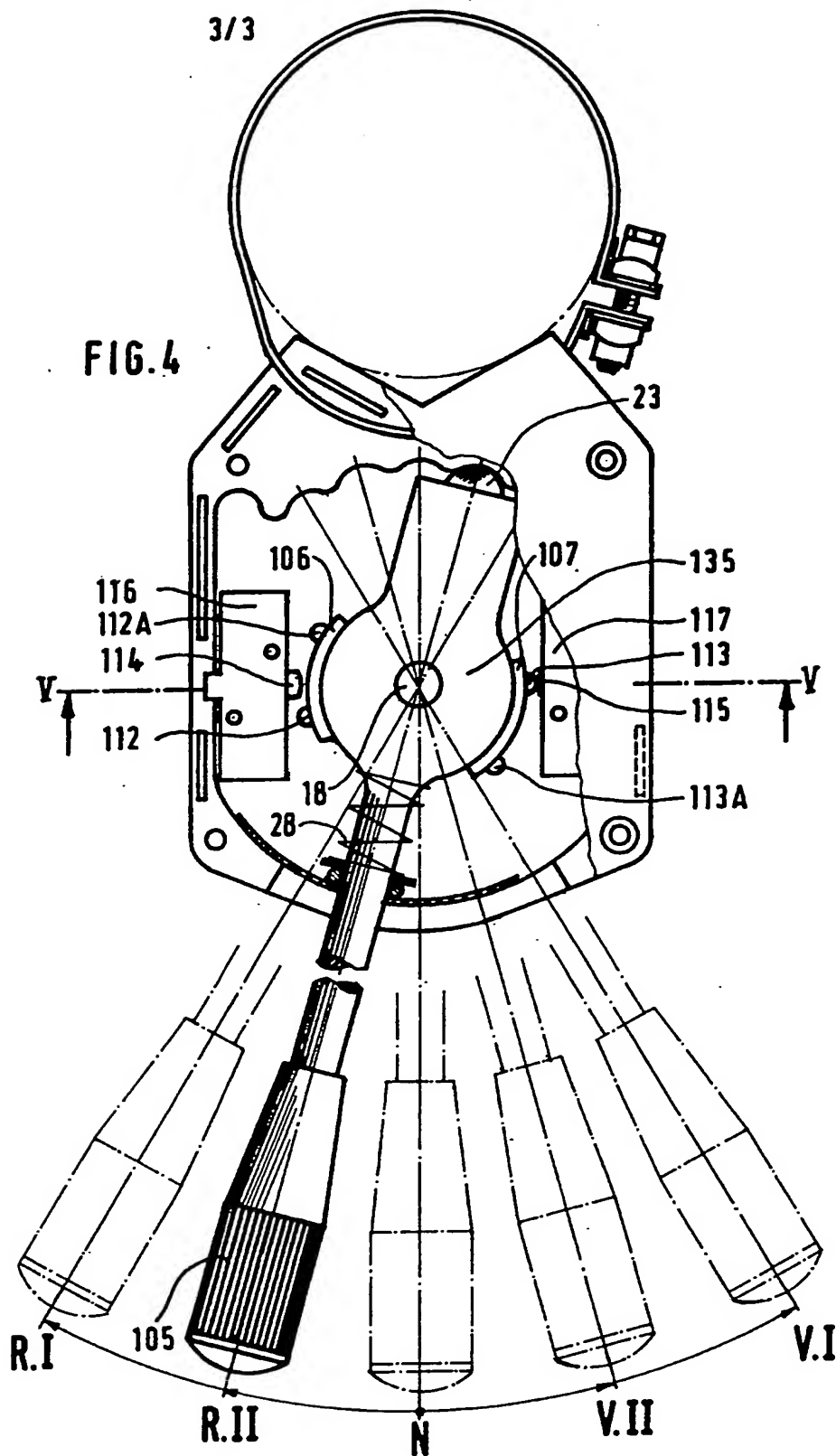


FIG. 3



SPECIFICATION

Electrical selector switch for motor vehicles

- 5 This invention relates to an electrical selector switch for a motor vehicle, for example a working machine having an electro-hydraulically controlled gearbox.

- British Patent Specification No. 1 327 040
10 discloses an electrical selector switch comprising a manually operable lever mounted pivotally on a housing for the actuation of electrical microswitches within the housing. A drawback of this known switch is that the switch lever is
15 composed of a number of individual parts which must be screwed together. Several individual parts which are different from one another are required for the switch housing.

- The invention aims at providing an electrical
20 selector switch, for example for a machine having an electro-hydraulically controlled transmission mechanism, which switch is simple to construct and may therefore be economically produced.

- 25 Accordingly, the present invention consists in an electrical selector switch for a motor vehicle, comprising a housing and a switch lever provided with a catch means and pivotally mounted about an axis in said housing for
30 the actuation of electrical switches with said housing, characterised in that the switch lever is of one-piece construction and includes cams for the actuation of the electrical switches, axle portions for the mounting of the switch
35 lever in the housing and a catch means guide for receiving said catch means. Advantageously, two axle portions are provided which are mounted in respective bores of two half shells which are of identical shape and form
40 said housing. Conveniently, the catch means mounted in the catch means guide comprises a catch spring, a catch ball and a disc located therebetween.

- The construction of the switch lever as a
45 one-piece component enables simple mounting of the lever as well as all the individual parts, such as the catch spring, catch ball, microswitch and a sliding sealing screen with a spring by simple insertion into one of the
50 half shells of the housing.

The axle portions disposed in bores of the two identical housing shells enable simple mounting of the one-piece switch lever.

- The sliding sealing screen disposed in both
55 housing shells and movable by the switch lever serves to cover an aperture for the switch lever in the housing in a dust-proof manner.

- In order that the invention may be more
60 readily understood, reference is made to the accompanying drawings which illustrate diagrammatically and by way of example two embodiments thereof, and in which:-

- 65 *Figure 1* is a plan view of a reversing switch with the upper half of the housing broken

away;

Figure 2 is a cross-section on the line II-II of Fig. 1;

- Figure 3* is a cross-section on the line III-III
70 of Fig. 1;

Figure 4 is a view similar to that of Fig. 1 of another embodiment of the reversing switch; and

- Figure 5* is a cross-section on the line V-V
75 of Fig. 4.

- The switch illustrated in Fig. 1 comprises a housing 1 which is made up of an upper half shell 2 and a lower half shell 3, a switch lever 5 and a tube clamp 4 for fastening the switch
80 to a steering column or the like. Reference numerals 6 to 9 indicate bores for screws which hold the halves of the housing together. A recess 10 is provided in the housing wall and the switch lever 5, together with a
85 sliding sheet metal plate 11, is movably disposed therein.

- The switch lever 5 is in the neutral position N. Both switch positions R and V are shown in dot-dash lines and are restricted by the end
90 surfaces of the recess 10. The sliding plate 11 moves with the switch lever 5 and covers the recess 10 in a dust-proof manner. Two lateral lugs 12 and 13 of the one-piece switch lever 5 are constructed as switch cams and
95 actuate tappets 14 and 15 of two microswitches 16 and 17 in the deflected positions of the switch lever. These microswitches are located in appropriately shaped recesses in the housing walls by means of lugs 33. Pins
100 31 in the bases of the two half shells 2 and 3 project into tubular rivets 32 of the microswitches and fasten these against lateral forces of the switch cams 12 and 13.

- Two axle portions 18 and 19 (see also Figs.
105 3 and 5) of the switch lever 5 consisting, for example, of plastics material project into blind bores 36 and 37 of the two half shells 2 and 3 so that the switch lever is pivotally
110 mounted about the axes of the bores after connection of the housing parts 2 and 3.

- The end of the switch lever 5 disposed in the housing serves as a catch means guide and has a blind hole 20 with a catch spring 21 (Fig. 3). The spring 21 is supported at one
115 end on the base of the blind hole 20 and, at the other end, via a plastics disc 22 on a catch ball 23 which is guided in the blind hole 20. The catch ball 23 is resiliently held in three catch recesses 24, 25 and 26 of the two half shells 2 and 3 in the three positions
120 of the switch lever 5.

- Between the sliding plate 11 and a projection 35 of the switch lever 5 there is disposed a compression spring 28 which urges the
125 sliding plate 11 against the inner wall 29 of the housing via a disc 30 and an O-ring 27.

- Both half shells 2 and 3 have on their end faces facing one another and symmetrical to the longitudinal axis of the housing (III-III)
130 projections 38 on the right-hand half of the

shell (as viewed in Fig. 1) and corresponding recesses 39 on the left-hand half of the shell. When the two half shells are joined together they are aligned by means of the projections 38 and recesses 39.

Fig. 2 shows the two half shells 2 and 3 joined together. The switch lever 5 with the two cams 12 and 13 is disposed between the two microswitches 16 and 17. The two axle portions 18 and 19 of the switch lever 5 project into the blind bores 36 and 37 of the two half shells. The shaft 40 of the switch lever 5 made of plastics material is reinforced by a wire 41.

Fig. 3 shows the two half shells 2 and 3 joined together, with the switch lever 5 and the catch means guide 20. This comprises the catch spring 21 with the disc 22 and the catch ball 23 which is disposed in the catch recess 24 (Fig. 1).

The clamp 4 is located in substantially semi-circular slots 42 and 43 of the half shells and is fastened therein when the half shells are joined together. One of the cams of the switch lever is designated by 12. The half shell 3 has a bore 44 for fastening a cable guide 45.

Figs. 4 and 5 show a further embodiment of a reversing switch for two gear speed positions in each direction of travel. The hub portion 135 of the switch lever 105 is provided with two segments 106 and 107 on each of which there is provided a pair of cams 112, 113 and 112A, 113A disposed in different planes.

Figs. 4 and 5 show the switch lever in the position R.II for the second reverse gear speed. The cam 113 actuates the tappet 115 of the switch 117 shown in Fig. 4. Further movement into the slow reverse gear speed R.I causes the tappet 114 (Fig. 4) of the switch 116 to be actuated by the cam 112. The switch 117 is simultaneously re-opened. On changing to the two forward gear speeds V.II and V.I the switches 116A and 117A shown only in Fig. 5 are successively actuated by the cams 112A and 113A.

The cams and switches may be associated with one another in any other manner.

The remaining parts of the reversing switch shown in Figs. 4 and 5 have the same shape and function as the corresponding parts of the embodiment shown in Figs. 1 to 3.

55 CLAIMS

1. An electrical selector switch for a motor vehicle, comprising a housing and a switch lever provided with a catch means and pivotally mounted about an axis in said housing for the actuation of electrical switches with said housing, characterised in that the switch lever is of one-piece construction and includes cams for the actuation of the electrical switches, axle portions for mounting of the switch lever in the housing and a catch means guide for

receiving said catch means.

2. A selector switch as claimed in claim 1, wherein two axle portions are provided which are mounted in respective bores of two half shells which are of identical shape and form said housing.

3. A selector switch as claimed in claim 1 or 2, wherein the catch means mounted in the catch means guide comprises a catch spring, a catch ball and a disc located therebetween.

4. A selector switch as claimed in claim 3, wherein said disc is of plastics material.

5. A selector switch as claimed in any of claims 2 to 4, wherein the housing is provided with an aperture in which the switch lever is guided, a sealing screen being disposed in the two housing shells and being movable by the switch lever in order to cover said aperture in a dust-tight manner.

6. A selector switch as claimed in any of claims 2 to 5, wherein both the half shells forming the housing are of plastics material.

7. A selector switch as claimed in claim 6, wherein said screen is a sheet metal plate which is slidable on the inner wall of the plastics housing.

8. A selector switch as claimed in any of claims 2 to 7, wherein each half shell is formed with a slot for receiving a tube clamp.

9. A selector switch as claimed in any of claims 2 to 8, wherein the half shells have, symmetrically with respect to the longitudinal axis of the switch, projections on one shell half and recesses on the other shell half, into which the projections enter when the half shells are joined together.

10. A selector switch as claimed in any of claims 1 to 9, wherein the switch lever has a shaft portion which is reinforced by a wire.

11. A selector switch as claimed in claim 1, wherein the switch lever comprises cams disposed in different planes perpendicular to its axis of rotation in order to actuate electrical switches superposed in pairs.

12. An electrical selector switch for a motor vehicle, substantially as herein described with reference to and as shown in the accompanying drawings.